

Plant Rock Filters

Construction and Maintenance

What is a plant rock filter?

Plant rock filters are a type of constructed wetland that uses aquatic plants growing in a rock filled trench through which wastewater passes. The plant roots and microorganisms living on the plant roots aid in the removal of pathogens and nutrients.

Purification of water by wetlands is a process that is as old as the earth, but researchers have been slow to experiment with the treatment of waste water by wetlands. However, NASA and TVA have been conducting research on wastewater treatment by wetlands for several years. And for the past decade, many other countries have also conducted research with wetlands in wastewater treatment.

Plant rock filters are a very effective method of providing final treatment to wastewater, before allowing the wastewater to discharge to the surface of the soil. They are especially useful in the repair of an existing wastewater system that is malfunctioning.

Plant rock filters have an added benefit in that they complement a house site with lush green vegetation and colorful flowers. With the right combination of plants, they can offer blooms from mid to late spring until frost. Certain plants adapted to this wastewater system will even remain green through the winter months.

Many species of decorative plants are well adapted to this system. These systems utilize certain types of aquatic plants which are sometimes used in water gardens. A few of the showier plants that can be used include Louisiana Iris, Pickerel Rush, Yellow Canna, Elephant Ears, and Ginger Lilies. Plant rock filters can be designed and landscaped into many home sites.

How do I design a plant rock filter?

The design of a plant rock filter is outlined in the Mississippi State Department of Health's Design Standard VII of the Regulation Governing Individual On site Wastewater Disposal. The plant rock filter can be one cell or, if soil conditions allow, two-cell with one cell lined and the other washed gravel or stone.

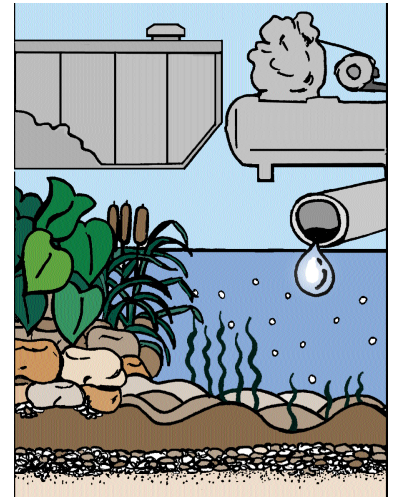
The lined cell should be completely lined with a continuous liner of approved material. The lined cell is then filled with gravel.

A plant rock filter must have an inlet pipe on one end and an outlet pipe on the opposite end. The outlet pipe enters a water control structure where the water level in the system can be adjusted so the water is a minimum of one inch below the gravel surface.

Water should never be exposed in this system, as this could encourage mosquito breeding. No soil material should be placed on top of the gravel..

Because plant rock filters provide only final treatment, a septic tank or treatment plant must be used before the plant rock filter.

This will provide primary treatment of the wastewater and prevent the plant rock filter from filling with solids.



As with all systems, the tank or treatment plant should be pumped periodically. The pump-out schedule will be determined by how much organic material is loaded into the system. A widely accepted general rule is to have the tank pumped out every three to five years.

Will a plant rock filter fit my property?

Plant rock filters are usually installed as a discharge system. This means that the wastewater is treated, then released on top of the soil. The wastewater must be chlorinated before releasing and must be maintained on the property of the generator.

There must be a minimum distance of 50 feet between the property line and the point where the wastewater will stop flowing, not the discharge point. The location of the discharge point must be located such as to ensure this 50-foot buffer even in the wetter periods of the year. Therefore, small parcels of property are generally not suited for plant rock filters. These systems will usually require at least two acres to maintain all discharge on the generator's property. More or less property may be required, depending on the location of the house and soil/site characteristics.

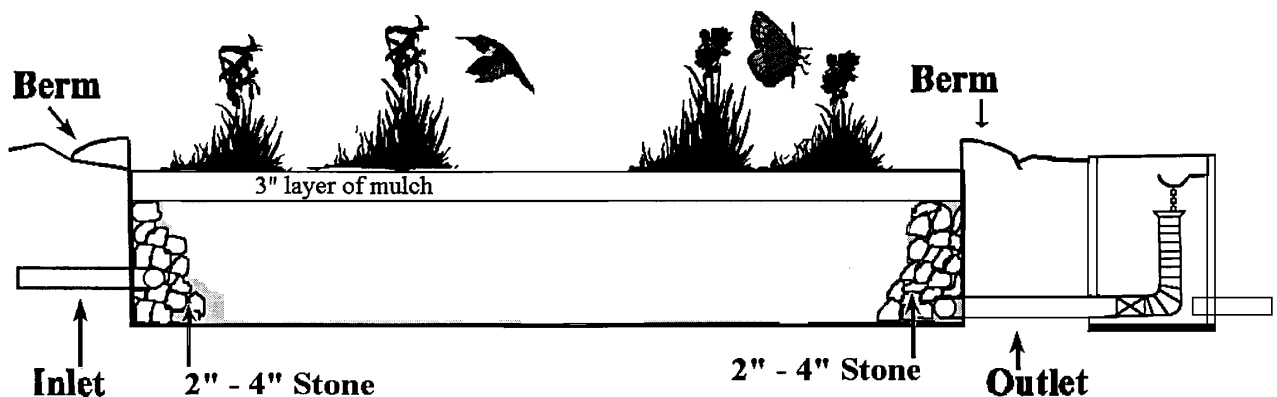
If space is available, these systems may be used in areas with high seasonal water tables and/or soils with clay textures. Unlike other types of discharge systems, plant rock filters will usually not have a discharge during summer and fall. This is conditional and will differ based on the amount of water used in a household and the number of plants in the system.

If for some reason the plant population is not sufficient, there will be a discharge. To minimize any discharge, it's important that plants be placed 12 to 18 inches apart at planting. Certain species of plants may require an occasional replanting due to insects, disease, or winter freeze to keep discharges minimal.

Is maintenance difficult on a plant rock filter?

Maintenance of the filter will consist of removing dead foliage after frost. You will also need to thin plants after several years of use. This will ensure the overall health of the plants and prevent the filter from becoming clogged with excess plant growth.

For more information about plant rock filters and their possible use for your home, contact your county public health environmentalist.



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